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Treatment of the off-periods of Parkinson's disease with levodopa and its derivative

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Levodopa is the gold standard API for the treatment of Parkinson's disease. It is mainly administrated per os and absorbed in the small intestines. The bioavailability of the levodopa is low and alternates because of numerous disadvantages belonging to this route, for example fluctuating gastric akinesia, high first-pass effect. When the levodopa concentration is low, the symptoms of off-periods appear. The intranasal route is an alternative possibility to treat the off-periods [1].

Unlike the levodopa, the melevodopa can be absorbed in the stomach because it exists in the non-ionized form at low pH, additionally, its solubility is much higher, therefore the bioavailability can become higher. As it can be absorbed in the stomach, the onset can be increased and the gastric akinesia can be eliminated.

The Syloid XDP 3050 –mesoporous silica – can adsorb a remarkable amount of compounds and the dissolution properties of the APIs can be regulated.

During work, preliminary experiments were executed to prepare drug delivery systems with fast dissolution. In the first part of the study, levodopa-containing nasal powder formulations were prepared with co-milling using excipient. In this study melevodopa was adsorbed on the surface of the Syloid to prepare tablet formulations to achieve a fast dissolution in the gastric medium. Physicochemical and *in vitro* studies were performed with the products.

Summarizing, drug delivery systems for the treatment of the off-periods of Parkinson's disease were prepared. A comparison of the pharmacokinetic parameters of the formulations is planned.

References

1. Kiss T. J. Pharm Sci. 108(8), 2552-2560 (2019)

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